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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,066	12/06/2001	Andrew T.H. Lin	7009-018	9047

7590

12/10/2003

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EXAMINER

TAMAI, KARL I

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 12/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/006,066

Applicant(s)

LIN ET AL.

Examiner

Tamai IE Karl

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 13 and 14 is/are rejected.
- 7) ☒ Claim(s) 9-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, Claim 1-14 in Paper dated 10/27/2003 is acknowledged.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign mentioned in the description:
91. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because the brief description of the drawings 8a-c and 9a-b, should be amended to 8a, 8b, and 8c; 9a and 9b because each figure is a separate drawing rather than a single drawing with three parts for figure

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8 or a single drawing with 2 parts for figure 9. Correction is required. See MPEP § 608.01(b).

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 7 and 8 are vague and indefinite because the selected parameters a, b, and c are undefined.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peeters et al. (Peters)(US 6504643) and Drake et al. (Drake)(US 6128122). Peeters teaches a micromirror supported by at least three springs 450 for rotation with at least two degrees of freedom by independent electrostatic electrodes 410 near the mirror. The spring attachments forming a polygon. The springs include two enhancement springs 415 which fan out at 90 from the support springs. Peters teaches every aspect of the invention except the length to thickness ratio being selected to support the springs in tensile mode. Drake teaches the length, width, and thickness are result effective variables (col. 7, line 26, col. 12, line 59). It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Peeters with the length to thickness ratio being selected to be in the tensile mode to provide a good restoring force, as taught by Drake, and because it has been held that

where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peeters et al. (Peeters)(US 6504643) and Drake et al. (Drake)(US 6128122), in further view of Magel et al. (Magel)(US 5629794). Peters and Drake teach every aspect of the invention except the mirror operating 100 volts between the mirror and the electrodes. Magel teaches the actuation voltage is 0-20 volts. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the micro mirror of Peeters and Drake, with the voltage between the mirror and electrodes being less than 100 volts because Magel teaches the actuation voltage is small for electrostatic actuators (20 volts) to provide high speed optical switching.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peeters et al. (Peeters)(US 6504643) and Drake et al. (Drake)(US 6128122), in further view of Knipe et al. (Knipe)(US 5739941). Peters and Drake teach every aspect of the invention except the angle between the support spring and the enhancement spring being between 90 and 180. Knipe teaches that inclined springs provides greater restoring forces. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the micro mirror of Peeters and Drake, with the angle between the support spring and the enhancement spring being between 90 and 180 to increase the restoring force as taught by Knipe.

14. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peeters et al. (Peeters)(US 6504643) and Drake et al. (Drake)(US 6128122). Peters and Drake teach every aspect of the invention except the restoring force selected to meet $au + bu^2 + cu^3$ or $au + cu^3$. It is inherent that the restoring force of Peeters and Drake increase with deflection. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the micro mirror of Peeters and Drake, with the restoring force selected to meet $au + bu^2 + cu^3$ or $au + cu^3$ to optimize the restoring force of the mirror, and because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

15. Claims 13 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Peeters et al. (Peeters)(US 6504643) and Drake et al. (Drake)(US 6128122), in further view of Tang et al. (Tang)(US 5894090). Peters and Drake teach every aspect of the invention except the recessed mirror with the electrodes acting outside the conceptual polygon. Tang teaches the springs recessed into the mirror with the electrodes 26a, 26b to provide a low cost, rugged electrostatic actuator. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the micro mirror of Peeters and Drake, with the recessed mirror with the electrodes acting outside the conceptual polygon to provide a low cost and rugged actuator, as taught by Tang.

Allowable Subject Matter

16. Claim 9-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (703) 305-7066.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Nestor Ramirez, can be reached at (703) 308-1371. The facsimile number for the Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Karl I Tamai
PRIMARY PATENT EXAMINER
November 28, 2003



KARL TAMAI
PRIMARY EXAMINER